



Tropentag, September 9-11, 2020, virtual conference

“Food and nutrition security and its resilience
to global crises”

Effect of Melatonin and Lighting Regime on Physiological Responses and Reproductive Traits of Layers

ROSEMARY OZIOMA IGWE¹, UDO HERBERT², ISAAC IKECHUKWU OSAKWE³

¹*Ebonyi State University, Abakaliki. Ebonyi State Nigeria., Animal Science, Nigeria*

²*Michael Okpara University of Agriculture Umudike, Abia State Nigeria, Animal Breeding and Physiology,*

³*Alex-ekwueme Federal University Undufu-alike Ikwo, Ebonyi State Nigeria, Animal Science, Animal Science,*

Abstract

Two experiments were conducted to evaluate the effect of melatonin and lighting regime on physiological responses and reproductive traits of two strains of laying birds using 324 laying birds. Each of the experiments consisted of 162 birds. Experiment I was with Nera Black strain while experiment II was with Isa Brown strain. Each of the experiments was grouped into 9 treatments which were further subdivided into three replicates of six birds each in a 2×3 factorial in a completely randomised design. Melatonin and lighting at three levels were administered to the birds four times weekly for 30 weeks. The three levels of melatonin were 0 mg, 5 mg and 10 mg while lighting were 12 hours, 15 hours and 18 hours daily. Melatonin was dissolved in 2 mls warm water and the birds were drenched while 100 watt bulbs were used to provide lighting. Results from the physiological responses showed that rectal temperature (RT), respiratory rate (RR) and heart rate (HT) were significantly ($p < 0.05$) influenced by both melatonin and lighting regime in the two experiments. Melatonin at 5 mg significantly ($p < 0.05$) reduced the RT, RR and HT with values of 41.55 °C, 142.56 and 327.11 respectively in experiment I and 40.55 °C, 139.44 and 320.22 respectively in experiment II. Performance characteristics were significantly ($p < 0.05$) influenced by both melatonin and lighting regime. The hen day egg production, feed conversion ratio and egg weight of 91.66 %, 1.73 and 61.52 g respectively for experiment II and 84.77 %, 1.61 and 70 g respectively for experiment I were recorded. The weight of the reproductive organs and the number of follicles were significantly ($p < 0.05$) improved by melatonin in both experiments. Large yellow follicles and small white follicles increased significantly with increasing level of melatonin in both experiments. Interaction between melatonin and lighting improved the overall performance of the birds as the groups on 5 mg of melatonin and 15 hrs lighting performed better than the other groups in both experiments. It is therefore concluded that 5mg melatonin and 15 hours lighting should be used to enhance egg production and improve the behavioural characteristics of laying birds during thermal stress.

Keywords: Follicles and performance, layers, lighting, melatonin, physiological, reproductive

Contact Address: Rosemary Ozioma Igwe, Ebonyi State University, Abakaliki. Ebonyi State Nigeria., Animal Science, Behind 7-Up Abakaliki-Enugu X-Press Way Ebonyi State Nigeria, +234 Abakaliki, Nigeria, e-mail: alorosemaryozioma@gmail.com